Problem Science Project

Do people work better in groups or by themselves? R. A. Vessey

Introduction

Have you ever wondered why so many teachers assign group projects? I have. I designed this experiment because I wanted to see whether scores are better when one works alone or as a group. I also wanted to see whether the results varied between boys and girls, and if they were better at Verbal or Mathematics.

Background Information

It is often said that two heads are better than one, by which people usually mean that working with others should produce better judgments than when working alone. But is this always the case? Are there times when working together can actually make a wrong answer more likely? We do a lot of group projects and it seems like sometimes one person ends up doing most of the work while the other person gets the same grade. It doesn’t seem fair sometimes, and it doesn’t seem like the second person is learning as much as they would if they were alone. In psychology this is called Social Loafing: riding on other peoples’ coattails in a group project when you’ll get a good grade even if you don’t work. But I’ve also seen times when two people that don’t know much work together and end up making each other more ignorant. It seems like if one person is sure of a wrong answer, they can make other people also believe the wrong answer. So pairing two people may not always produce better work.

My dad helped me find a research study that looked at whether two heads are better than one (Puncochar and Fox, 2004). They reviewed research that showed groups tend to be more accurate than individuals on hard problems. They conducted some studies and showed that not only will groups get more right, but often they will come to firmly believe a wrong answer just because the group decided on it. In fact, the individual would be much more confident in a wrong answer than they would in a right answer. I decided to look and see if boys were better at working together than girls, and if it made a difference whether they were working on Math or Verbal problems, since it is often believed that girls are better at Verbal problems than Math problems.

Hypothesis

I predicted that both boys and girls would work better as a group. I also thought that girls would do better at verbal and the boys at math.

Materials

* 10 individual tests
* 10 group tests
* 1 scored group test
* Grading sheet
* Pen
* Pencils
* Stopwatch

Procedure

* Get ten boys and ten girls
* Test boys alone
* Test boys as a group
* Grade
* Test girls alone
* Test girls as a group
* Grade
* Compare scores
* Gather data
* Write up report
* Return tests to participants

Results

Boys individual Range: 0-7

Boys’ average individually: 3.4/12 28 1/3%

Boys score as a group: 8/12 66 2/3 %

Girls individual range: 0-3

Girls’ average individually: 2.1/12 17.5%

Girls’ score as a group: 3/12 25%

Observations

Boys

Individuals

* Talking & couldn’t understand the words
* Whispers heard
* Some tried to work together…I stopped them
* One tried to turn his in after a couple of minutes
* After 3 minutes one refused to work & started to pose for the camera
* After seven minutes majority became restless
* Tried to read/ use ipods
* One used ipod throughout despite being asked not too…others stopped
* One left for office after ten minutes, but test was finished and he returned
* Finished completely in 11 minutes

Group

* Fought over master sheet
* Some stood around master sheet
* Read aloud
* Discussed every question
* Brian stabbed Caleb with a pencil
* Discussed some correct answers they later changed
* Did all seemingly indifferent
* Finished in 6 minutes

Girls

Individuals

* One tried to turn hers in after a couple of minutes
* Not sure of words
* Whispers…but much quieter than boys
* Some chewing gum
* No photos
* A TON OF DOODLING
* Wrote notes on others papers…asked not too
* Wanted to beat boys, but low confidence
* Finished in 9 minutes

Group

* Read aloud
* No fighting over master sheet
* Some stood around master sheet
* Asked for calculator…refused
* One just sat there and didn’t participate
* Two got up to get hand sanitizer
* Some drew on faces with pencil
* Giggles

Afterwards for All

Every person who wrote down the steps for one specific problem answered it correctly

Conclusion

My first hypothesis was correct. Both the girls and the boys improved when working in a group. The boys, however, improved much more. They also had a higher individual score. My second hypothesis, however, was wrong. Boys did better at verbal, and girls did better at math, the exact opposite of what I had expected.

Whether boy or girl, however, the group scores were not higher for either verbal or math than the highest individual scores. I noticed that a few hard-working people, most of them labeled as “smart”, did the majority of the work. One boy who got a perfect score on verbal did the majority of the verbal problems for the boys as a group. The group received a perfect score on verbal. The math followed the same pattern. The less hardworking people usually just sat there and did nothing. I believe this has a direct relation to the classroom. The one who works hard receives hardly any more points than usual, and the one who doesn’t receives the other’s grade. This information nowhere near testifies the amount of group projects assigned.

Possible Causes of Error

Girls and Boys were tested on different days at different times

All the boys were in the higher math class, some girls were not

Further Research

Match groups on intelligence.

Slightly easier questions, other kinds of questions.

Vary size of groups.

Mixed gender groups.

Possible Applications

This information could be used to better assign projects in school.

Time Spent

Setting Up Project: 1 hour

Making Tests: 3 hours

Conducting Experiment: 1 ½ hours

Grading Papers: ½ hour

Gathering Data: 1 hour

Making Graph: ¼ hour

Making Power Point: 1hour

Finishing Research Paper: 1 ½ hours

Total Time Spent: 9 ¾ hours

References

CollegeBoard. "Question of the Day." SAT. February 21, 2011. sat.collegeboard.com/practice/answered-question-of-the-day?src=E&questionId=20110222&answerCd=C&ep\_ch=QD&ep mid=6810678&ep\_rid=19482901 (accessed February 15, 2011).

Meltzoff, J.   (2008)   *Critical thinking about research: Psychology and related fields.*   Washington, DC:   American Psychological Association

Puncochar, J & Fox, P. (2004) Confidence in Individual and Group Decision Making: When “Two Heads” Are Worse Than One. *Journal of Educational Psychology*, 96 (3), 582-591.